PR-21. NANOMODIFIED BACTERIA *ALCANIVORAX BORKUMENSIS* AS AN INDICATOR OF CARBOHYDRATES IN SEA WATER

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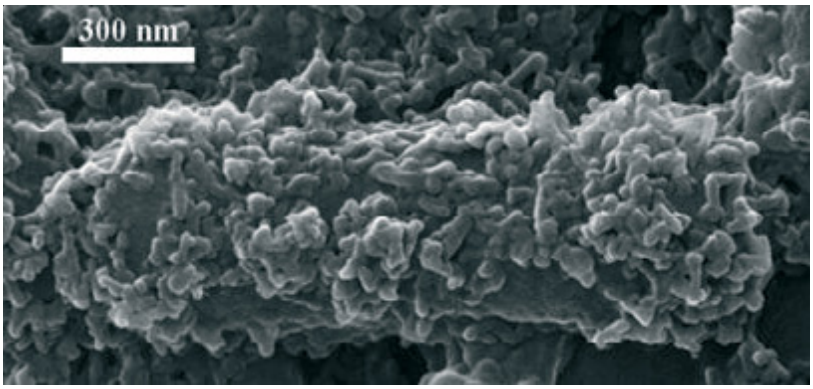
Currently contamination of the marine environment with toxic compounds is a serious environmental problem. Determination of the composition, type and amount of toxic compounds in the environment is an important task. The obtained data about type of compounds can be the basis for the development of effective and safe tool/method of cleaning contaminated sites of the ecosystems. *Alcanivorax borkumensis* – marine hydrocarbonoclastic bacteria with specialized metabolism of degradation of petroleum hydrocarbons. In this work we propose a method for the magnetization of bacteria *A. borkumensis*. Such modified bacteria can be effectively and successfully use as indicators of the content of hydrocarbons, petroleum compounds and products in the environment. Magnetic cells can become a sensitive element of biosensors and microfluidic devices.

In the work we developed a cell surface modification method of bacteria *A. borkumensis* by nanoparticles of iron oxide (Figure). Magnetic nanoparticles stabilized by polyelectrolytes was attaching on cell surface by method of direct deposition. It was shown that after modification the enzyme activity of the cells did not decrease. It was shown that the cells artificially got magnetic properties. After the modification it became possible to move the cells under the impact of a permanent magnet. In addition nanomodified bacteria cells are much more easy to fix on the electrode. We propose the use of nanomodified cells of *A. borkumensis* as a sensitive element in sensors to determine the content of hydrocarbons in the marine environment.



Scanning electron micrograph of *A. borkumensis* bacteria modified by magnetic nanoparticles

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